

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
Fact Sheet**

Permittee's Name: U.S. Fish and Wildlife Service - Alchesay National Fish Hatchery

Mailing Address: P. O. Box 398
Whiteriver, AZ 85941

Plant Location: 9 Miles North of Whiteriver, AZ in Navajo County

Contact Person(s): Sherry White
Project Leader (928)338-4901

NPDES Permit No.: AZ0000116

I. Status of Permit

The Alchesay National Fish Hatchery submitted a timely reapplication for a National Pollutant Discharge Elimination System (NPDES) permit dated June 19, 2005 to allow a discharge from the hatchery to the North Fork White River. The previous NPDES permit was issued on December 21, 2000.

II. General Facility Information

The cold water trout hatchery raises approximately 88,000 pounds of trout per year (79,000 pounds of rainbow trout, 7,000 pounds of brown trout, and 2,000 pounds of Apache trout) for stocking streams on 18 Indian Reservations in Arizona and New Mexico under Department of Interior trust responsibilities. The hatchery is located approximately nine (9) miles north of Whiteriver, Arizona in Navajo County. The facility obtains intake water from the North Fork White River, run it through the hatchery operations, and discharge back to the same stream.

III. Receiving Water

In order to protect the designated uses of surface waters, the White Mountain Apache Tribe (WMAT) of the Fort Apache Indian Reservation has adopted water quality standards for different stream segments depending on the level of protection required. The WMAT Water Quality Protection Ordinance lists the North Fork White River below Alchesay spring as a marginal coldwater habitat. Additional designated uses include irrigation, domestic and industrial water supply, groundwater recharge, livestock and wildlife, primary contact, ceremonial primary contact, gathering of plants, and cultural significance.

IV. Effluent Limits and Rationale

A. Process Description

The following table describes the type of discharge flow volume and location of the various outfalls associated with this NPDES permit.

Outfall Information

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Outfall Number and Types of Discharge	Average Flow	Location	Treatment
001 a. Raceway effluent, unused water and leakage from standing pipes	0	North Fork White River in the Salt River Basin	None
002 a. Effluent from fish ponds	0	North Fork White River in the Salt River Basin	None
003 a. Effluent from fish ponds	9.28 MGD	North Fork White River in the Salt River Basin	None

The facility obtains intake water from the North Fork White River, where river water is settled in a settling tank prior to dispersion to the on-site ponds. Solids collected from the source water have historically been flushed back into the stream. However, the hatchery is in the process of reconfiguring the influent treatment system, and instead of flushing solids back to the stream, the hatchery will flush solids into an unlined settling basin. The settling basin will periodically be cleaned, and solids will be sent off site.

Influent water gravity flows to each of the unlined ponds. Hatchlings are brought from the nearby Williams Creek hatchery and raised at the Alchesay site. Fish are harvested manually by slowly draining down the water levels in the pond thru the outfall weir prior to fish removal. Overflow from the ponds passes over a weir and is discharged directly to the North Fork White River. There is no treatment of the effluent.

The White Mountain Apache Tribe conducts surface water monitoring of the North Fork White River as part of their ambient water assessment. Representatives of the Tribe have noted algae growth in the stream downstream of the hatchery. It is not known if the algae growth is due to the hatchery effluent, if it is due to other non-point sources in the watershed, or some combination of the sources.

B. Previous Permit Limitations

The following summarizes the previous permit requirements for Outfalls 001, 002, and 003 from the Alchesay National Fish Hatchery.

Constituent	Current Limitations*	Monitoring Requirements	
		Measurement Frequency	Sample Type
Flow (m ³ /day)	No Numeric Standard	Twice/month	Continuous

Constituent	Current Limitations*	Monitoring Requirements	
		Measurement Frequency	Sample Type
Suspended Solids	10 mg/l monthly avg., 15 mg/l daily max.	Twice/month	Composite
Total Nitrogen	0.5 mg/l monthly avg., 2 mg/l daily max.	Once/3 months	Composite
Total Phosphorus (as P)	0.1 mg/l monthly avg., 0.8 mg/l daily max.	Once/3 months	Composite
pH	6.5 - 9.0 s.u.	Twice/month	Grab

* Note that the existing permit also contains mass limitations for suspended solids, total nitrogen, and total phosphorus based on a maximum flow of 14.4 MGD.

Net limitations for Total Suspended Solids may only be applied when the concentration of suspended solids in the influent exceeds daily maximum permit concentration limits. Calculate net limitations by subtracting the suspended solids concentration in the influent from the suspended solids concentration in the effluent, then compare net amount against permit limits. Report computation method used to derive suspended solids values in an addendum to the DMR.

C. Discharge Monitoring Report (DMR) Data

The EPA requires Alchesay National Fish Hatchery to monitor parameters either twice a month or once every three months and to report the results monthly. DMR data for the previous permit period were reviewed for purposes of developing the permit. There was no discharge reported for Outfalls 001 and 002.

Total Suspended Solids. Since January, 2002 effluent levels of TSS have ranged from 1 mg/l to over 600 mg/l. However, intake TSS levels during this period ranged from 2 to over 700 mg/l. High effluent concentrations in the effluent correlated with high concentrations in the intake water, as indicated by the net TSS limitations allowance in the permit. In all cases, the facility effluent was in compliance with the TSS limitations or the net effluent limitations. During periods when the intake concentration was low (i.e., in the 5 – 15 mg/l range) the hatchery generally added approximately 2 to 7 mg/L of TSS, although there were also a number of instances when effluent concentrations were decreased in the effluent by a similar amount. During periods when the intake sediment levels were high due to precipitation events, effluent concentrations were generally lower than influent concentrations due to settling in the ponds and in the distribution tank. At times, effluent levels were substantially lower (100 to 200 mg/l) than influent concentrations.

Total Nitrogen. Since January 2002, effluent levels for Total Nitrogen have ranged from 0.26 mg/l to 1.07 mg/l. Of the 28 samples taken, only 4 were below the monthly average effluent limit, while all were below the daily maximum effluent limit. Although the permit does not allow for net credits of Total Nitrogen, it should be noted that influent concentrations during this period ranged from 0.12 to 2.16 mg/l (influent samples not necessarily taken on the same days as

effluent). From paired influent/effluent data, the average net increase in Total Nitrogen from the hatchery was 0.12 mg/l.

Nitrate + Nitrite: Since January 2002, effluent levels of Nitrate + Nitrite have ranged from 0.01 mg/l to over 0.10 mg/l, with one outlier at 6.0 mg/l (taken 2/14/06). All but one sample (out of 31 samples) were therefore in compliance with the effluent limits. Due to the fact that the 2/24/06 sample was 2 orders of magnitude higher than the average concentration, and all other parameters were normal for that day, there is some suspicion that this result may have been the result of sampling error.

Total Phosphorus. Since January, 2002 effluent levels of total phosphorus have ranged from 0.013 mg/l to 0.095 mg/l, all of which were in compliance with effluent limits.

Bioassessment. The previous permit required that the facility perform annual bioassessments of the receiving stream above and below the hatchery discharge point. The purpose of these bioassessments was to provide a survey of benthic macroinvertebrates in an effort to determine the influence of hatchery effluent on receiving water. If no significant difference detected between macroinvertebrate communities upstream and downstream of the discharge, then bioassessments could be discontinued after two years of study. The assessments concluded that there was no significant difference in the 2 sample sites, and that the hatchery was not having an adverse affect on aquatic wildlife.

V. Justification for Numeric Effluent Limitations

EPA promulgated new effluent limitation guidelines and standards for aquaculture facilities in June, 2004. (40 CFR Part 451). The national technology-based regulation applies to the discharge of pollutants from a concentrated aquatic animal production facility that produces 100,000 pounds or more per year of aquatic animals in a flow-through or recirculating system. The Alchesay National Fish Hatchery produces less than 100,000 pounds per year, and is therefore not subject to the effluent limitations guidelines. EPA therefore establishes permit requirements based upon Best Professional Judgment, where the effluent limitation guidelines may be considered as guidance for best management practices. Due to the fact that the permittee is only slightly below the 100,000 pounds per year cutoff, EPA has decided to establish Best Professional Judgement (BPJ) limits generally consistent with the intention of 40 CFR Part 451 where applicable. The requirements are as follows and have been incorporated into the proposed permit:

A. Solids control. The permittee must:

- (1) Employ efficient feed management and feeding strategies that limit feed input to the minimum amount reasonably necessary to achieve production goals and sustain targeted rates of aquatic animal growth in order to minimize potential discharges of uneaten feed and waste products to waters of the U.S.
- (2) In order to minimize the discharge of accumulated solids from settling ponds and basins and production systems, identify and implement procedures for routine cleaning of rearing units and off-line settling basins, and procedures to minimize any discharge of accumulated solids during the inventorying, grading and harvesting aquatic animals in the production system.

(3) Remove and dispose of aquatic animal mortalities properly on a regular basis to prevent discharge to waters of the U.S., except in cases where the permitting authority authorizes such discharge in order to benefit the aquatic environment.

B. Materials storage. The permittee must:

- (1) Ensure proper storage of drugs, pesticides, and feed in a manner designed to prevent spills that may result in the discharge of drugs, pesticides or feed to waters of the U.S.
- (2) Implement procedures for properly containing, cleaning, and disposing of any spilled material.

C. Structural maintenance. The permittee must:

- (1) Inspect the production system and the wastewater treatment system on a routine basis in order to identify and promptly repair any damage.
- (2) Conduct regular maintenance of the production system and the wastewater treatment system in order to ensure that they are properly functioning.

D. Recordkeeping. The permittee must:

- (1) In order to calculate representative feed conversion ratios, maintain records for aquatic animal rearing units documenting the feed amounts and estimates of the numbers and weight of aquatic animals.
- (2) Keep records documenting the frequency of cleaning, inspections, maintenance and repairs.

E. Training. The permittee must:

- (1) In order to ensure the proper clean-up and disposal of spilled material adequately train all relevant facility personnel in spill prevention and how to respond in the event of a spill.
- (2) Train staff on the proper operation and cleaning of production and wastewater treatment systems including training in feeding procedures and proper use of equipment.

F. Chemical Usage. Additionally, EPA has included the following requirement to document chemical usage at the site. EPA continues to believe that Whole Effluent Toxicity (WET) testing is not necessary due to the absence of a reasonable potential for the effluent to cause in stream toxicity. However, the reporting requirements for chemical usage may be evaluated in the future to determine if WET testing is required: The permittee must:

- (1.) Submit annually by January 31st each year a list of all chemicals added to water in the fish hatchery during the preceding year.
- (2.) The chemical list shall include antibiotics, fungicides, detergents, and other cleaning agents, disinfectants and any other chemicals added to the water. The submittal shall include information on frequency and duration of use, purpose, and amounts.

Unless otherwise noted, the following permit limitations must be met when discharging from Outfall 003.

pH: Limits are retained from the previous permit. These limits reflect WMAT water quality standards for marginal coldwater habitat.

Total Suspended Solids: Limits are based on the limits in the previous permit, which in turn were based upon a determination made by the now-defunct Arizona Water Quality Control Council in 1976. This determination established specific suspended solids limitations for sensitive waters, including the White River and its tributaries.

Total Ammonia: Ammonia limits have been added to the previous permit based on the WMAT Water Quality Protection Ordinance (Section 3.6) in accordance with the table for coldwater habitat in Appendix A. As a protective measure, the effluent limitation is based on the highest pH reading (7.8) and the summer and winter temperatures provided by hatchery managers.

Summer: 22° C (72° F) Chronic: 1.20 mg/L Acute: 7.30 mg/L
 Winter: 0.6° C (33° F): Chronic: 2.30 mg/L Acute: 9.90 mg/L

Total Nitrogen: WMAT Standards include water quality standards for Total Ammonia and do not include water quality standards for Total Nitrogen. Therefore, the permit has incorporated limits for Total Ammonia as specified in the WMAT Standards in place of limits for Total Nitrogen. Effluent limits for Total Nitrogen have been removed from the permit, although the permit continues to require monitoring in order to assess potential downstream impacts. The removal of Total Nitrogen qualifies as an exception to the prohibition against backsliding based on the revision of the Tribe's water quality standards, and is considered "new information" that was not available at the time of permit issuance (10 CFR Part 122.44(l) (2)(B)).

Total Phosphorus. The permittee has requested that EPA consider establishing a limit based on orthophosphate instead of total phosphorus, noting that orthophosphate is a more accurate measure of the organically bound phosphorous which is directly available to algae growth, and that the orthophosphate test is one that can be readily done on-site, thus providing cost savings.

At this time, EPA does not have enough information to establish limits for orthophosphate in place of total phosphorus. First, EPA would have to be able to establish a translator to convert the orthophosphate results to the water quality criterion for the North Fork White River, which is given as total phosphorus. During 2007, the permittee has conducted simultaneous samples of effluent for both orthophosphate and total phosphorus.

	orthophosphate	total phosphorus
1/9/07	0.052	0.056
4/3/07	0.029	0.053
7/10/07	0.041	0.038
9/18/07	0.065	0.068

As noted above, 3 of the samples demonstrated similar results for orthophosphate compared to total phosphorous (about 4 % difference) while one of the results demonstrated a 45% difference in the two results. Based on this data, EPA cannot at this time establish a limit for orthophosphate that can be directly translated to total phosphorous that would be protective of the total phosphorus water quality standard. Second, it is not clear to EPA that the orthophosphate analysis is complete measurement of the hatchery input to the system. In the pond system, many of the fecal solids settle to the bottom of the ponds and appear to remain there for some time, during which biological activity may be converting organic phosphorus to inorganic phosphorus. As indicated by sampling data, there are times when both influent and effluent contain high solids, which may contain phosphorous in either organic or inorganic form and that may be discharged in the effluent. Although EPA would consider establishing orthophosphate limits, the relationship to total phosphorus is not understood well enough at this time to replace the limits for total phosphorus.

Nitrate + Nitrite: The receiving water is designated as a source of domestic water supply. The Tribe indicated its plans to construct a dam downstream of the hatchery to provide drinking water to nearby residences. Therefore, EPA evaluated existing concentrations of nitrate from the hatchery effluent to compare to drinking water quality standards. The drinking water quality standard for nitrate is 10 mg/l. Since January, 2002 effluent levels of Total Nitrogen have ranged from 0.01 mg/l to 0.10 mg/l, with one outlier at 6.0 mg/l (taken 2/14/06). All but one sample (out of 31 samples) demonstrated results an order of magnitude below the drinking water standard, and the one sample on 2/14/06 was still below the drinking water standard but significantly higher than all other results. Due to the fact that the 2/24/06 sample was 2 orders of magnitude higher than the average concentration, and all other parameters were normal for that day, there is some suspicion that this result may have been the result of sampling error. EPA has concluded that the hatchery effluent does not have the reasonable potential to cause an exceedance of drinking water quality standards for nitrate.

Whole Effluent Toxicity (WET) – EPA does not believe that there is the reasonable potential for the effluent to cause or contribute to effluent toxicity. However, EPA is including a reporting condition in the permit that the permittee must submit annually by January 31st each year a list of all chemicals added to water in the fish hatchery during the preceding year. The chemical list shall include antibiotics, fungicides, detergents, and other cleaning agents, disinfectants and any other chemicals added to the water. The submittal shall include information on frequency and duration of use, purpose, and amounts. The information may be used to assess the need and specifications for possible WET testing or specific substance monitoring in the future.

As required in 40 CFR §§122.45(b) and (f), mass-based effluent limitations are established for all parameters described above based on a design flow of 14.4 MGD.

VI. Narrative Water Quality Based Effluent Limitations

Based on the WMAT Narrative Water Quality Standards, the following narrative limitations have been included in the permit:

- A. Tribal waters shall be free of contaminants in such quantity and duration as may, with reasonable probability, injure human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property. In addition, the following narrative standards apply to all Tribal Waters, unless stricter standards are imposed.
 - 1. **BOTTOM DEPOSITS.** The bottoms of all Tribal waters shall be free from water contaminants from other than natural causes that will settle and cause deleterious effects to the aquatic biota, including fish, or significantly alter the physical or chemical properties of the bottom.
 - 2. **FLOATING SOLIDS, OIL, AND GREASE.** All waters shall be free from visible oils, scum, foam, grease and other floating materials and suspended substances of a persistent nature resulting from other than natural causes.

3. **COLOR.** Materials producing true color resulting from other than natural causes shall not create an aesthetically undesirable condition; nor shall color impair the attainable uses of the water or harm aquatic life.
4. **ODOR AND TASTE.** Water contaminants from other than natural causes shall be limited to concentrations that will not impart unpalatable flavor to fish, result in offensive odor or taste arising from the water, or otherwise interfere with the existing and attainable uses of the water, nor shall taste and odor-producing substances of other than natural origin interfere with the production of a potable water supply by modern treatment methods.
5. **NUISANCE CONDITIONS.** Nutrients or other substances stimulating algal growth from other than natural causes shall not be present in concentrations that will produce objectionable algal densities, nuisance aquatic vegetation, result in a dominance of nuisance species in stream, or otherwise cause nuisance conditions.
6. **TURBIDITY.** Turbidity attributable to other than natural causes shall not reduce light transmission to the point that the aquatic biota is inhibited or that will cause an unaesthetic and substantial visible contrast with the natural appearance of the water. Specifically, turbidity shall not exceed 5 NTU over background when background turbidity is 50 NTU or less. When background turbidity is more than 50 NTU, there shall not be more than a 10% increase in turbidity. Background turbidity may be estimated by measuring levels upstream of the human-caused impacts or during zero runoff periods (greater than five (5) days after most recent event).
7. **TEMPERATURE.** The introduction of heat by other than natural causes shall not increase temperature outside mixing zones by more than 2.0⁰ C (5⁰ F), based upon the monthly average of the maximum daily temperatures measured at mid-depth or three feet (whichever is less) outside the mixing zone. Normal daily and seasonal variations of temperature that were present before the addition of heat from other than natural sources shall be maintained. In no case shall heat of artificial origin be permitted when the maximum temperature specified for the reach would thereby be exceeded. High water temperatures caused by unusually high ambient air temperatures are not violations of these standards. In cases where dissolved oxygen levels are within 0.5 mg/l of the limit, no increases in temperature will be allowed.
8. **SALINITY/MINERAL QUALITY** (total dissolved solids, chlorides, and sulfates). Existing mineral concentrations shall not be altered by municipal, industrial, or instream activities, or other waste discharges that would interfere with established designated uses. No increase exceeding 1/5 of naturally-occurring levels shall be permitted.
9. **pH.** The pH of a stream or a lake shall not fluctuate in excess of 1.0 pH unit over a period of 24 hours for other than natural causes and shall be within a range of 6.5-9.0.
10. **DISSOLVED OXYGEN.** If a surface water body is capable of supporting aquatic life, dissolved oxygen concentration shall be maintained at a minimum of 6.0 mg/l.
11. **TOXIC SUBSTANCES.** Toxic substances, including, but not limited to pesticides, herbicides, heavy metals, and organic chemicals, shall not be present in Tribal waters above those levels identified in 40 CFR section 131.36 as toxic to human, animal, plant, or aquatic

life, or to interfere with the normal propagation, growth, and survival of the aquatic biota, including fish. There shall be no acute toxicity. At the edge of the mixing zones there shall be no chronic toxicity

VII. Significant Changes to Previous Permit

As described in Section V, EPA has incorporated new effluent limits for total ammonia and has removed effluent limits for total nitrogen based on WMAT water quality standards.

As described in Section V, EPA has incorporated new requirements based on new Effluent Limitations Guidelines for Aquaculture as a BPJ limit.

As described in Section V, EPA has incorporated additional records and reporting requirements to report quantities of chemical usage.

EPA has eliminated Outfalls 001 and 002 from the permit. These outfalls have been permanently closed and are not expected to discharge in the future.

Based on previous results, EPA has not continued the requirement to conduct additional bioassessments of the receiving stream that were contained in the previous permit.

VII. Special Conditions

As described in Section V, the proposed permit contains requirements generally consistent with the intention of 40 CFR Part 451 regarding control of solids, materials storage, structural maintenance, recordkeeping, training, and chemical usage.

VIII. Threatened and Endangered Species

EPA reviewed the publication: Endangered and Threatened Species of Arizona, Spring 1998. Ecological Services Field Office, U.S. Fish and Wildlife Service; and an updated list of "Federally Threatened and Endangered Species of Arizona" (March 31, 1998), to determine whether the discharge would affect any endangered species or habitat. The review indicated that there are 7 bird and fish species of concern for Navajo County, including the Bald Eagle, Peregrine Falcon, Mexican Spotted Owl, Humpback Chub, Apache Trout, Little Colorado Spinedace, and Loach Minnow. The major reason for decline in these species is habitat destruction. The major reason for decline of the Bald Eagle and Peregrine Falcon is the effect of DDT on the reproductive cycle.

This NPDES permit continues to authorize the discharge of hatchery raceway and pond effluents into areas that are not habitat to the aforementioned threatened and endangered species. The permit contains provisions for monitoring conventional and nonconventional pollutants, and requirements for receiving water bioassessments of benthic invertebrates, to ensure an appropriate level of water quality discharged by the facility. Re-opener clauses have been included should new information become available to indicate that the requirements of the permit need to be changed.

None of the listed species are impacted by water quality and therefore by the NPDES permit action. The Alchesay National Fish Hatchery was constructed sometime ago, and no new construction or modifications will be made to it due to the NPDES permit.

In considering all information available during the drafting of this permit, EPA believes that a NO EFFECT determination is appropriate for this federal action. A copy of the draft permit reissuance and statement of basis will be sent to the Pinetop Office of the U.S. Fish and Wildlife Service Arizona Fishery Resources Office for review and comment.

IX. Affects on Historic Properties

The reissuance of the permit should have no impact on historical and/or archeological sites since no construction activities nor changes to the operation are planned in the reissuance.

X. Permit Reopener

The permit contains a reopener clause to allow for modification of the permit if reasonable potential is demonstrated during the life of the permit.

XI. Standard Conditions

Conditions applicable to all NPDES permits are included in accordance with 40 CFR, Part 122.

XII. Administrative Information

A. Public Notice (40 CFR §124.10)

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft NPDES permit or other significant action with respect to an NPDES permit or application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit.

B. Public Comment Period (40 CFR §124.10)

Notice of the draft permit will be placed in a daily or weekly newspaper within the area affected by the facility or activity, with a minimum of 30 days provided for interested parties to respond in writing to EPA.

After the closing of the public comment period, EPA is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

C. Public Hearing (40 CFR §124.12(c))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A

public hearing will be held when there is a significant amount of interest expressed during the 30-day public comment period or when it is necessary to clarify the issues involved in the permit decision.

D. Certification (40 CFR §§124.53 and 124.54)

After the draft permit has been revised to include any relevant comments from the 30-day public comment period, it is forwarded to WMAT for CWA Section 401 certification. This certification ensures that the permit will comply with applicable Federal CWA standards as well as with WMAT Water Quality Protection Ordinance. EPA Region 9 will not issue this permit until a 401 certification is received.

XIII. Additional Information

Additional information relating to this proposed permit may be obtained from the following locations:

U.S. Environmental Protection Agency, Region IX

CWA Standards & Permits Office Mail Code: WTR-5
75 Hawthorne Street
San Francisco, California 94105-3901
Telephone: (415) 972-3518
Attn: John Tinger

XIV. Information Sources

While developing effluent limitations, monitoring requirements and special conditions for the permit, the following information sources were used:

1. NPDES Permit Application Form 1 and Form 2B, dated June 21, 1999, reapplication forms submitted July 7, 2005.
2. Water Quality Protection Ordinance of the White Mountain Apache Tribe of the Fort Apache Indian Reservation. Adopted September 1, 1999.
3. Arizona Water Quality Standards for Surface Waters, Title 18, Chapter 11, Article 1. Adopted April 24, 1996.
4. 40 CFR Parts 122 and 125.
5. Endangered and Threatened Species of Arizona, Spring 1998. Arizona Ecological Field Office, U.S. Fish and Wildlife Service.